

REMARKS

Claims 1 and 33-35 were examined. Claim 1 is amended. Claim 36-37 are added. Claims 1 and 33-37 remain in the Application.

The Patent Office rejects claim 1 under 35 U.S.C. §112, first paragraph and second paragraph. The Patent Office also rejects claims 1 and 33-35 under 35 U.S.C. §103(a). Reconsideration of the rejected claims is respectfully requested in view of the above amendments and the following remarks.

A. 35 U.S.C. §112, First Paragraph: Rejection of Claim 1

The Patent Office rejects claim 1 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Specifically, the Patent Office believes that Applicant has not disclosed a position sensor alone.

The Application describes that "[i]t will be appreciated by those skilled in the art that the tachometer/position sensor may simply be a tachometer OR a position sensor, with the speed of the drive shaft and its angular position being mathematically related to each other as a function of elapsed time. In addition, elapsed time and the reel drive shaft's speed or angular position are mathematically related to the linear speed (e.g., at feet per second) at which the hose and drogue are being extended or retracted and their instant position, depending the particular geometry (e.g., drum and hose diameters) of the reel and hose." Page 4, lines 15-21 (emphasis added). As is clear from the quoted language, the Application describes embodiments including a tachometer or a position sensor. Thus, the Application discloses a position sensor alone.

Applicant respectfully requests that the Patent Office withdraw the rejection to claim 1 under 35 U.S.C. §112, first paragraph.

B. 35 U.S.C. §112, Second Paragraph: Rejection of Claim 1

The Patent Office rejects claim 1 under 35 U.S.C. §112, second paragraph, as indefinite. Applicant amends claim 1 to address the concern raised by the Patent Office. Applicant

respectfully requests that the Patent Office withdraw the rejection to claim 1 under 35 U.S.C. §112, second paragraph.

C. 35 U.S.C. §103(a): Rejection of Claims 1 & 33-35

The Patent Office rejects claims 1 and 33-35 under 35 U.S.C. §103(a) as obvious over U.S. Patent No. 3,674,049 of Macgregor (Macgregor) in view of U.S. Patent No. 5,561,979 of Coutant et al. (Coutant) and U.S. Patent No. 6,241,462 of Wannasuphoprasit et al. (Wannasuphoprasit).

Macgregor is cited for disclosing a refueling system comprising a hose reel, a drogue, a hose reel drive system comprising a fixed displacement hydraulic motor, a microprocessor, and a tachometer. Macgregor uses two mechanisms working in parallel to retract and extend a hose reel: (1) a spring motor; and (2) a fixed displacement pump.

Coutant is cited for disclosing a variable displacement hydraulic motor. Coutant actually discloses a hydrostatic system using a variable displacement pump coupled to a motor through a shaft. Coutant describes a pump used for speed control.

The solenoid operated proportional valve moves in response to the control signal and directs pressurized fluid to the displacement controller of the variable displacement pump to change the displacement thereof. Once the speed of the output shaft is achieved, the microprocessor modifies the control signal to maintain the variable displacement pump at the needed displacement position to maintain the desired speed of the output shaft to a work system. This arrangement provides an accurate control of the displacement of the variable displacement pump without the need of providing complicated follow-up mechanisms and/or servo mechanisms. (Abstract)

Coutant describes a control arrangement that controls a displacement of a variable displacement pump and a displacement of a variable displacement motor in response to fluid flow as opposed to being pressure responsive. See col. 2, lines 1-5.

Consequently, special follow-up mechanism such as servo valves are not needed thus reducing the complexity and cost of the system. (Col. 2, lines 5-7.)

Wannasuphoprasit is cited for disclosing the use of a reel torque sensor on a suspended cable.

The Patent Office believes it would be obvious to modify Macgregor to include the variable displacement pump of Coutant and the reel torque sensor of Wannasuphoprasit. The Patent Office admits that none of the references describe an electro-hydraulic control valve but believes such valves are well known and one would be motivated to use one for reliability and a further defined control system in comparison to a mechanical servo mechanism. Such statement is in contrast to the above-quoted language of Coutant that "special follow-up mechanism such as servo valves are not needed" for its system. The Patent Office also admits that none of the references describe a position sensor, but believes such sensors are also well known. Applicant respectfully requests that the Patent Office provides some motivation for using such "well known" servo valves and sensors in the context of a hose reel drive system such as described in the claims.

Claims 1 and 33-35 describe a hose reel drive system comprising a variable displacement hydraulic motor having a control piston that controls displacement of the motor and is controlled by a pressure change in an electro-hydraulic control valve and an output shaft connected to a reel. Support for a variable displacement hydraulic motor having a control piston that controls displacement of the motor and is controlled by a pressure change in an electro-hydraulic control valve may be found in the Application at, for example, page 3, line 30 through page 4, line 2. In contrast to Macgregor and Coutant, one advantage of the claimed hose reel drive system is that the variable displacement hydraulic motor controls torque and speed.

The variable displacement hydraulic motor will be instructed to act either as a motor (providing driving torque), causing the reel to retract the hose at a speed up to 20 feet per second, if the net drag torque falls below 80% of the free trail drag torque, or as a pump (providing resistance torque), allowing the reel to extend the hose at a speed up to 20 feet per second, if the net drag torque rises above 90% of the free trail drag torque.

Application, page 8, lines 3-8. Further, unlike Coutant, the same device is acting as a pump and a motor.

Claims 1 and 33-35 are not obvious over the cited references, because the combination of references do not disclose or provide any motivation, suggestion or prediction for a variable displacement hydraulic motor having a control piston that controls displacement of the motor in and is controlled by a pressure change in an electro-hydraulic valve. Macgregor describes a hose reel system using a spring motor and a fixed displacement pump working in parallel. Simply substituting the variable displacement pump of Coutant with the fixed displacement pump of Macgregor does not teach the claimed system including a variable displacement hydraulic motor since the combination would still require two mechanisms to retract and extend a hose reel: a spring motor and a variable displacement pump. Further, the combination does not teach a hydraulic motor that has a control piston that controls displacement of the motor and is controlled by a pressure change in an electro-hydraulic valve.

As noted above, the claimed variable displacement hydraulic motor controls speed and torque. The variable hydraulic pump of Coutant controls only speed. For this further reason, claims 1 and 33-35 are not obvious over the cited references.

Applicant believes there is no motivation, teaching or prediction of a hose reel drive system including a variable displacement hydraulic motor having a control piston that controls displacement of the motor in response to a pressure change.

Applicant respectfully requests that the Patent Office withdraw the rejection to claims 1 and 33-35 under 35 U.S.C. §103(a).

D. New Claims 36 & 37

Applicant adds new claim 36. Claim 36 describes a system where the variable displacement hydraulic motor is configured to act as a pump to rotate the reel rotates in one direction and as a motor to rotate the reel in an opposite direction. Support for claim 36 may be found in the Application at, for example, page 8, lines 3-8. As noted above, the cited references do not teach or provide any motivation, suggestion or prediction for this feature.

Claim 37 describes a system where the microprocessor contains instructions to direct the motor to provide driving torque to rotate the reel in a first direction and resistance torque to rotate the reel in a different second direction. Support for claim 37 may be found in the

CONCLUSION

In view of the foregoing, it is believed that all claims now pending patentably define the subject invention over the prior art of record and are in condition for allowance and such action is earnestly solicited at the earliest possible date.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly extension of time fees.

Respectfully submitted,

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7/21/08

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